Amendments to the Claims:

Please cancel Claims 1 – 75 and 77 – 96 without prejudice or disclaimer, and add Claims 97 – 112 as indicated in the following listing of claims, which replaces all prior versions and listings of claims in the application.

Listing of Claims:

1. – 75. (Canceled).

76. (Currently Amended) A method for perfusing cells with a reagent comprising the steps of:

(a) providing a microfluidic device having

(i) a cell growth chamber,

a cell inlet in communication with said chamber, said cell inlet having an inlet valve in operable communication therewith to ~~valve~~ control fluid flow through said cell inlet into said chamber, wherein said cells can pass through said cell inlet into said chamber when said inlet valve is open, but cannot pass through said cell inlet when said inlet valve is closed; and,

(ii) a reagent inlet for inputting said reagent into said chamber, said reagent inlet having a reagent valve in operable communication with said reagent inlet for ~~valving~~ controlling fluid flow through said reagent inlet into said chamber, said cell inlet and/or said chamber having a~~n~~ retention mechanism for retaining said cells in said chamber while permitting flow of said reagent into said chamber when said reagent valve is open;

wherein when said cells are loaded into said chamber, and said ~~cell~~ inlet valve is closed, said cells are retained in said chamber by the retention mechanism while said reagent valve is open and closed;

(b) opening said cell inlet valve and introducing said cells into said chamber;

(c) closing said cell inlet valve;

(d) opening said reagent valve to introduce said reagent into said chamber; and,

(e) introducing said reagent into said chamber while retaining said cells inside of said chamber thereby perfusing said cells with said reagent.

77. – 96. (Canceled).

97. (New) The method recited in claim 76 wherein the microfluidic device further comprises a release mechanism for releasing the cells from the retention mechanism, the method further comprising releasing the cells from the retention mechanism.

98. (New) The method recited in claim 97 wherein the microfluidic device further comprises an output mechanism for outputting the cells from the microfluidic device, the method further comprising outputting the cells from the microfluidic device with the output mechanism.

99. (New) The method recited in claim 97 wherein the microfluidic device further comprises a cell culture mechanism for culturing the cells, the method further comprising culturing the cells in the cell culture mechanism.

100. (New) The method recited in claim 76 wherein:

the microfluidic device comprises a multi-layered elastomeric block having a control layer; and

the inlet valve comprises an elastomeric membrane comprised by the control layer and deflectable into an elastomeric passage in a fluid layer to selectively determine a flow rate or flow path of a fluid in the elastomeric passage.

101. (New) The method recited in claim 76 wherein the microfluidic device further comprises a treatment mechanism in communication with the retention mechanism, the method further comprising selectively treating at least one of the cells with the treatment

mechanism to produce a treatment response while the at least one of the cells is retained within the retention mechanism.

102. (New) The method recited in claim 101 wherein the cells are selected from the group consisting of eukaryotic cells, prokaryotic cells, plants cells, animal cells, hybridoma cells, bacterial cells, and yeast cells.

103. (New) The method recited in claim 102 further comprising isolating the at least one of the cells from a remainder of the cells.

104. (New) The method recited in claim 102 wherein:

the at least one of the cells comprises an egg or an embryo; and

treating the at least one of the cells comprises a step towards in vitro fertilizing of the egg or manipulating the embryo.

105. (New) The method recited in claim 76 wherein the cell inlet comprises a receptacle or well in fluid communication with the chamber, the method further comprising introducing fluid containing the cells into the receptacle or well.

106. (New) A microfluidic device comprising:

a cell growth chamber;

a cell inlet in communication with said chamber, said cell inlet having an inlet valve in operable communication therewith to control fluid flow through said cell inlet said chamber, wherein cells can pass through said cell inlet into said chamber when said inlet valve is open but cannot pass through said cell inlet when said inlet valve is closed; and

a reagent inlet for inputting a reagent into said chamber, said reagent inlet having having a reagent valve in operable communication with said reagent inlet for controlling fluid flow through said reagent inlet into said chamber,

wherein said cell inlet and/or said chamber has a retention mechanism for retaining said cells in said chamber while permitting flow of said reagent into said chamber when said reagent valve is open.

107. (New) The microfluidic device recited in claim 106 further comprising a release mechanism for releasing the cells from the retention mechanism.

108. (New) The microfluidic device recited in claim 107 further comprising an output mechanism for outputting the cells from the chamber.

109. (New) The microfluidic device recited in claim 107 further comprising a cell culture mechanism for culturing the cells.

110. (New) The microfluidic device recited in claim 106 wherein:

the microfluidic device comprises a multi-layered elastomeric block having a control layer; and

the inlet valve comprises an elastomeric membrane comprised by the control layer and deflectable into an elastomeric passage in a fliud layer to selectively determine a flow rate or flow path of a fluid in the elastomeric passage.

111. (New) The microfluidic device recited in claim 106 further comprising a treatment mechanism in communication with the retention mechanism.

112. (New) The microfluidic device recited in claim 106 wherein the cell inlet comprises a receptable or well in fluid communication with the chamber.